Appendix D – Examples

(Informative)

The following are intended to serve as examples of how users of this standard might implement and maintain information about FTRP and FTSeg.

4 Improvements in FTRP over time

Within a particular geographic area additional FTRP can be identified over time, and existing FTRP can be improved by the creation of newer records containing upgraded Locational_description, Accuracy_statement or coordinate values. The addition or improvement of existing FTRP is not a matter of improving density or accuracy of points, as most often understood in establishment of geodetic control. Nor need the sequence or densification of FTRP over time correspond to a "top-down" hierarchy in the development of Framework transportation data.

Most typically FTRP extracted from Federal-level databases will be less dense and less accurate, because of the scale and the transportation features of interest to Federal users of data. FTRP derived from local-level databases will very likely contain more complete locational_descriptions and accurate coordinates and – where such databases exist – may be developed sooner than (or instead of) FTRP derived from at the Federal level.

Figure 21 is intended to illustrate how an FTRP which serves as the end points for FTSeg_98 and FTSeg_96 could be improved over time:

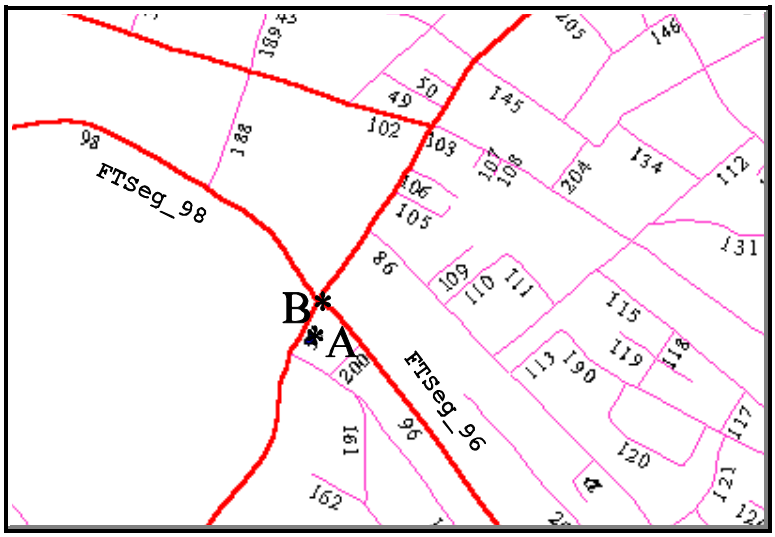

Figure 21 – Improvements in FTRP over time

ID	Auth.	Date	Description & Accuracy Statement	LAT.	LONG.
A	US-DOT	1996-0101	Intersection of Vermont Route 12 and US Route 2 in Montpelier (VT); position extracted from ITS Datum Prototype,V1.1; estimated accuracy = +/-80 ft	44.25738	-72.5783
B	City	1998-0101	Intersection of road center lines of Vermont Route 12 and US Route 2 in Montpelier (VT); position based on 1:5000 digital Ortho photograph; estimated accuracy = +/- 11 ft.	44.25739	-72.5782

5 Economical Placement of FTRP

Figure 22 shows the designation of an FTRP (P3) at the intersection of a state highway and a county road. Both physical roads are represented as FTSeg which terminate at this intersection. Additional FTRP should not be introduced to mark the intersection with a driveway or with a local road which is not assigned an FTSeg.

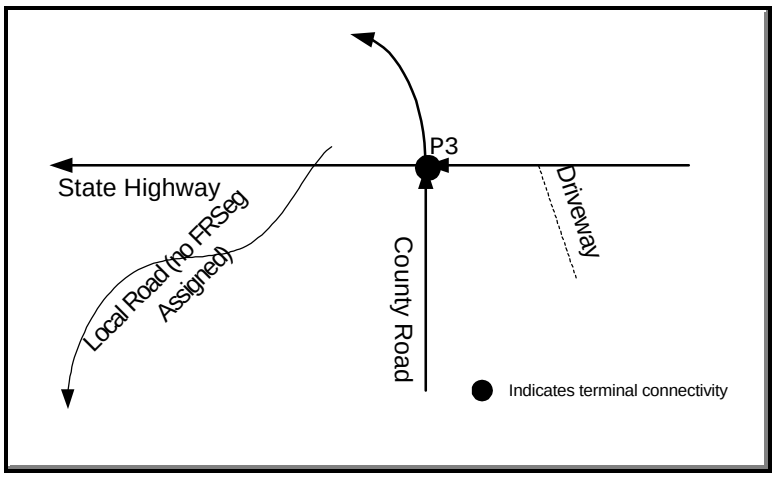

Figure 22 Economical placement of FTRP with regard to intersections

6 Transportation Segments and Sub-state Jurisdictional Boundary Lines

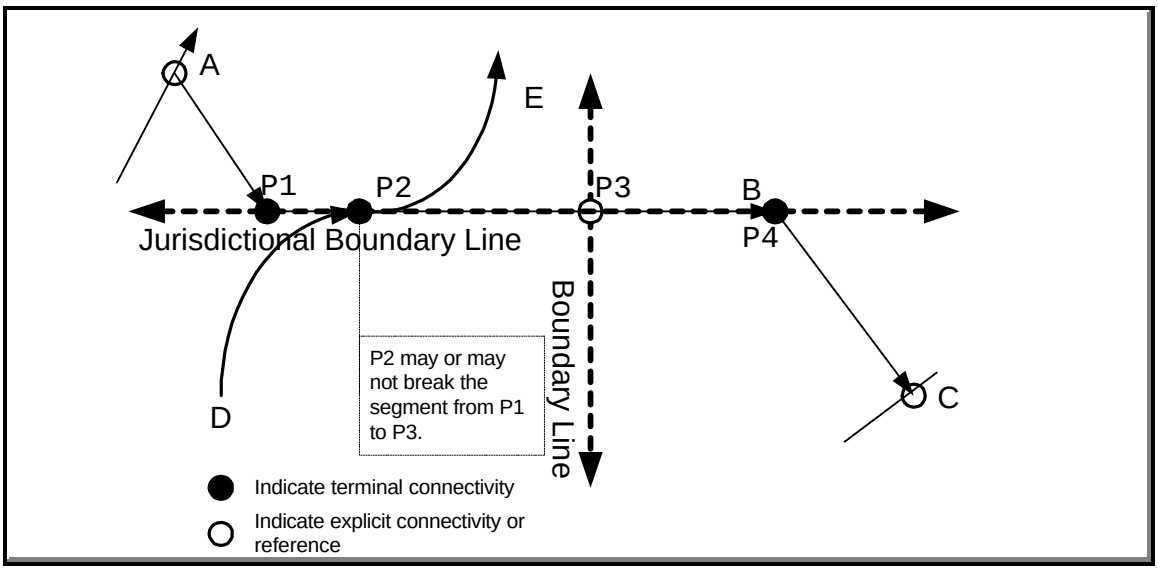

Figure 23 - Roads on or crossing Boundaries

Figure 23 illustrates the identification of FTRP at various points in and around the intersection of roads with a sub-state boundary. A road runs from point “A” to point “C”, running along several township or county boundaries, passing through the shared corner of four jurisdictions, and taking a short departure from the boundary around point “B”. In this example the transportation segments terminate at points “A” and “C,” and these FTRP explicitly connect these segments to other segments not illustrated. Further, FTRP “P1" and “P4" would be used to terminally connect segments at the points where the road leaves the county boundary. “P3" would be a reference FTRP which identifies the point where the road crosses a boundary line which separates one pair of jurisdictions from a

different pair of jurisdictions. Additional FTRP would be identified around point “B” only if transportation authorities determine that it is made up of significant segments.

Additionally, an FTRP could (optionally) be defined at“P2" – the point where road “D-E” intersects the jurisdictional boundary. Point “P2" could terminally connect segments of road “D-E,” but need not break the FTSeg between P1 and P4. P2 would break this segment only if transportation authorities determined that creation of two FTSeg between P1 and P4 would be helpful for data sharing.

7 Road (Re)Construction

The “Old Road” `FTSeg_1` ran from point “P1" to the intersection at reference point “P2,” where it implicitly connected with `FTSeg_3` and `FTSeg_4`. It has been replaced by a reconstructed `FTSeg_2`, which terminates at the new “P3.” P2 and P3 may be at nearby locations; but P2 must be retained as a terminus of `FTSeg_3` and `FTSeg_4`, as well as the unnamed segment which runs to the right edge of Figure 24. P3 must be created in order to reflect the

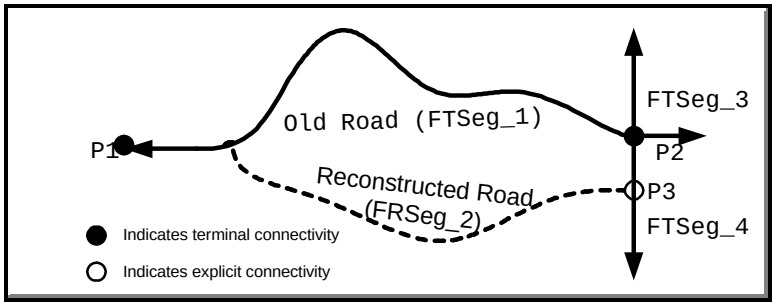

Figure 24 - Road Reconstruction

creation of FTSeg_2, and is explicitly connected to FTSeg_4 at some offset along its length. The following records need to be created, updated and retired:

	Segment / Point ID	Action	Description
Action 1	FTSeg_1	Retire	Old road is discontinued
Action 2	FTSeg_2	Create	New road is constructed
Action 3	P2	Update	Modify description to reflect retirement of FTSeg_1
Action 4	P3	Create	Create new record reflecting reconstructed reference point of FTSeg_2

8 Integration of Multiple FTRP and FTSeg at a Complex Intersection

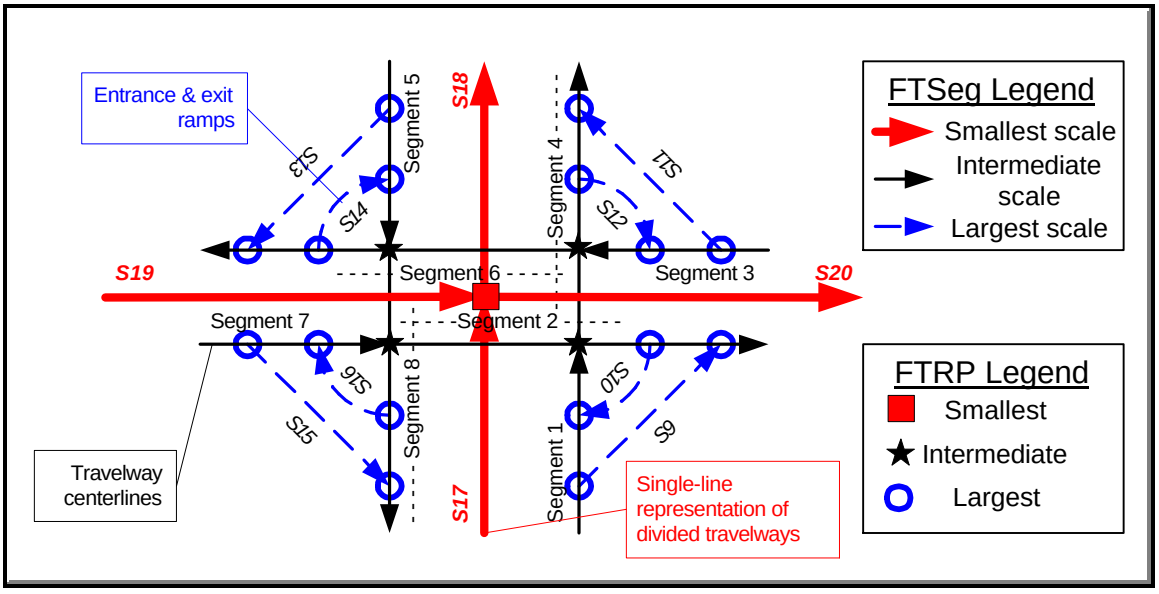

Figure 25 - Integration of Multiple FTRP and FTSeg at a Complex Intersection

Figure 25 illustrates the FTSeg and FTRP which might be used to represent a complex intersection of divided roadways. Red objects (heavy lines) illustrate how the intersection might be represented in a small-scale spatial database (e.g. those based on TIGER files). Black objects (normal lines) illustrate how the same intersection might be represented in a spatial database for which 1:24,000 topographic maps provided the source materials. Blue objects (dashed lines) illustrate the FTSeg and FTRP which would be necessary to represent segments for each exit and entrance ramp in a large-scale spatial database (e.g., those developed from source materials scaled at 1:12,000 or larger). Users of the red, blue, and black objects must be able to relate information contained in one database to the segments and points represented in the other database(s). Use of shared objects and maintenance of the Connectivity Table are the keys to this integration.

9 Creation of a new FTRP

New FTRP should be identified and created only when an existing FTRP cannot be utilized because the **Location-Description** and **Horizontal-Accuracy-Description** code do not indicate that the desired point is located appropriately, or with the degree of accuracy desired by the data developer. *Example: An existing FTRP is described as being located "at the intersection of centerlines" of an elevated crossing, and coded as being based on 1:100,000 scale source maps. A developer of a local E-911*

transportation database requires greater precision, so creation of a new record is needed.

9.1 Existing FTRP: Unhelpful (estimated) Accuracy

Figure 26 illustrates a situation in which a developer of "intermediate scale" transportation data identifies the pre-existing FTRP_1. This FTRP has a **Horizontal-Accuracy-Description** code which leads the developer to estimate its location as anywhere within the red circle around FTRP_1.

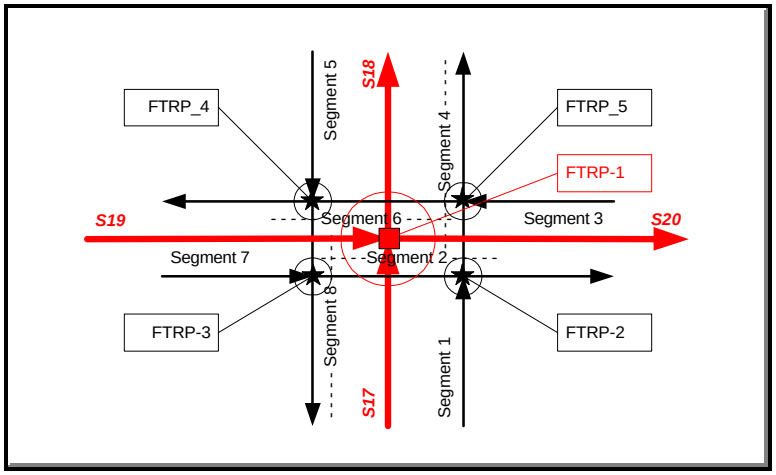

Figure 26 - Illustration of a pre-existing FTRP insufficiently accurate for "intermediate scale" reference

The developer must create new FTRP_2 through FTRP_5 in order to terminate Segments 1 through 8, and to allow accurate depiction of connectivity along these segments. The black circles around each of these FTRP indicate the locational accuracy which the data developer is able to assign to these points.

The developer should also create four entries in the FTRP Equivalency Table to document the logical identity between FTRP_2 through FTRP_5, and FTRP_1. (See following

Section.) **New FTRP are created, and require entries in the FTRP Equivalency Table in order to support connectivity with the larger-scale data set.**

9.2 Existing FTRP: Useful (estimated) Accuracy

The sequence of events is reversed in the Figure 27. That is, the developer of "small scale" data discovers the pre-existence of FTRP_1 through FTRP_4 useful for "medium scale" database representation. The "small scale" developer believes each of these FTRP to be positioned with an accuracy represented by the circle around FTRP_1. This is a point whose accuracy description meets the less-exacting locational accuracy requirements inherent in the "small scale" database.

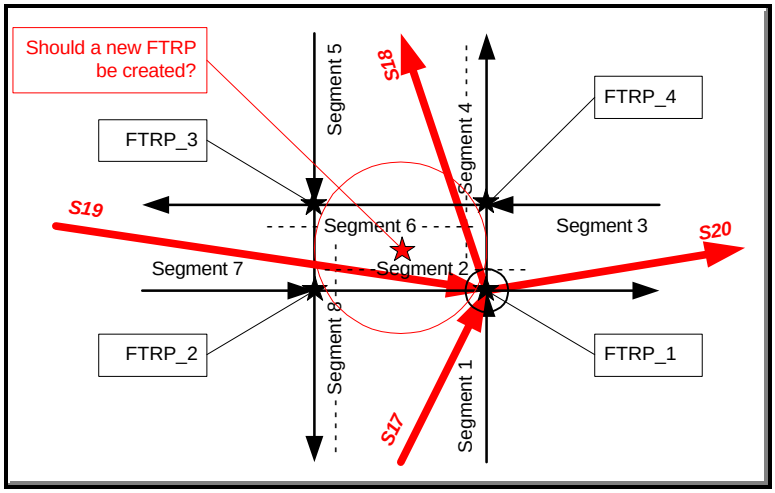

Figure 27 - Illustration of a pre-existing FTRP useful for "small scale" reference

Therefore, rather than creating a new FTRP (represented by the red star at the center of the intersection) the data developer utilizes the existing FTRP_1. **An existing FTRP is utilized, and no new entries in the FTRP Identity Table are required.**